a protective cylindrical member enclosing said ene end of the tubular solid electrolyte body, said protective cylindrical member having at least one opening to permit said exhaust gas to be in contact with said one end of said tubular body; and

a bar-shaped heater inserted in said elongate bore of said tubular solid electrolyte body, and comprising a resistance heating portion having a positive temperature coefficient of resistance of not less than 0.3%/°C. and a ceramic body carrying said resistance heating portion, the resistance heating portion being located only in said one end of the tubular body and extending only within the protective cylindrical member enclosing said one end of said tubular solid electrolyte body.